

REGULATORY GUIDANCE
FOR
27 CCR FINANCIAL ASSURANCE COMPLIANCE

Postclosure Maintenance
Step-Down Criteria - Proactive Monitoring

Purpose

The purpose of this document is to provide guidance on the preparation and implementation of a proactive monitoring program (PMP). The implementation of a PMP may impact the level of financial assurance required of a landfill operator.

Financial Assurance Requirements

State regulations (Title 27 California Code of Regulations [27 CCR] section 22211) require the operator of each solid waste landfill that accepted waste on or after January 1, 1988, to demonstrate financial responsibility (financial assurance) for postclosure maintenance until released from postclosure maintenance. Postclosure maintenance financial assurance is required for the entire postclosure maintenance period; that is, until the owner/operator demonstrates that the waste no longer poses a threat to public health and safety and the environment.

Amount of Financial Assurance

For landfills that do not have final closure and postclosure maintenance plans approved on or before July 1, 2010, the amount of financial assurance must be at least the amount of the greater of either the most recently approved or most recently submitted postclosure maintenance annualized cost estimate multiplied by 30. Unless the operator meets specified conditions contained in the regulations, this multiplier will continue for a minimum of 30 years and until the owner/operator is released from postclosure maintenance. A release from postclosure maintenance may be approved by the regulatory agencies if the landfill owner/operator demonstrates that the waste no longer poses a threat to public health and safety and the environment and all other requirements of postclosure maintenance identified in the approved postclosure maintenance plan or statutes/regulations have been met.

After five (5) years of completed postclosure maintenance activities, at each postclosure maintenance plan review, the operator may submit a request for approval to use a reduced multiplier (i.e., step-down). A reduced multiplier may be approved if certain criteria have been satisfied.

General Step-Down Criteria

The purpose of allowing an owner/operator to step-down (i.e., provide less financial assurance), is to provide an incentive for an owner/operator to perform high-quality postclosure maintenance. Accordingly, a four-part, performance-based criteria must be satisfied for approval of the step-down. The criteria provide evidence that the owner/operator is performing high-

quality postclosure maintenance. High-quality performance during these years is anticipated to result in lower future maintenance and repair costs and fewer and less costly corrective actions. Reduced costs and frequency of correction will reduce the risk to the State upon default by an owner/operator. The criteria for qualifying for a step-down are stringent but achievable.

The criteria are:

- With certain exceptions, the operator has not been subject to an enforcement order of EA, CalRecycle, or Regional Water Quality Control Board (RWQCB) during the five-year interval prior to the requested reduction, and the landfill has not been placed on the Inventory of Facilities Violating State Minimum Standards;
- There must have been no disbursements from the corrective action financial assurance demonstration during the same five-year period;
- The postclosure maintenance estimated activities and costs must have been consistent with the actual activities and costs at the closed facility; and
- **The owner/operator must have consistently performed an approved proactive monitoring program.**

Proactive Monitoring Criterion

Specifically, for the proactive monitoring criterion, the regulations state:

“The operator has consistently performed a proactive monitoring program that has been described in the operator’s postclosure maintenance plan that has been approved by EA, CalRecycle, and RWQCB. The proactive monitoring program shall include, but not be limited to the following: leachate quality and quantity; landfill gas generation and migration; groundwater quality; and final cover settlement, stability, integrity, and maintenance history including repair and replacement. If the operator is already monitoring one or more of the items identified in this section due to other requirements, these may be included within the proactive monitoring program. The proactive monitoring program shall ensure that the operator is obtaining information in order to determine the characteristics and trends of leachate, landfill gas, groundwater and final cover both individually and as they interact with each other in the landfill. The operator shall analyze the data to determine if postclosure maintenance activities have been and will be effective in meeting the requirements of §§21090 and 21180. The monitoring data and evaluation shall be made available to EA, CalRecycle, and RWQCB upon request,” [22211(a)(2)(C)2]

In other words, a proactive monitoring program is one that evaluates and demonstrates the overall condition of the landfill. The program must be described within the postclosure maintenance plan and approved by the regulatory agencies.

Proactive Monitoring Program

To the extent that proactive monitoring is already being conducted, the owner/operator would not have to increase monitoring efforts. However, routine regulatory required (compliance) monitoring such as quarterly, semiannual, or annual monitoring of ground water and landfill gas migration monitoring wells, in and of itself, would not be considered proactive monitoring. The purpose of these compliance monitoring wells is to determine if leachate or gas has adversely impacted the environment and whether the landfill has violated State standards. However, this monitoring data, alone, does not define the overall condition of the landfill. The purpose of proactive monitoring is to determine the overall condition of the landfill and any trends in the condition. Although compliance monitoring data may be acceptable for a PMP, an approved PMP must include an evaluation process that identifies how the landfill system is functioning over time. A properly designed, closed, and maintained landfill should stabilize over several years after closure. A proactive monitoring program is one that monitors and confirms this stabilization.

A proactive monitoring program is a programmatic assessment of the stabilization of a closed landfill over a time period where monitoring and compliance data is compiled and qualified to make a determination of the overall condition of the landfill. At a minimum, it includes analysis, evaluation, and reporting over and above that required for compliance monitoring – but not necessarily additional data collection. The program should evaluate the potential need for additional monitoring points, constituents, or parameters above that required for routine compliance monitoring. It is anticipated that facilities with extensive compliance monitoring programs above minimum regulatory standards may not need additional monitoring points and constituents or parameters. The additional cost and effort for those facilities will be solely for the additional technical analysis and reporting to integrate and aggregate the existing monitoring data. However, if the proactive monitoring program determines there is a need for additional monitoring points, constituents, or parameters to evaluate the performance goals for proactive monitoring, they will be required for approval of a step-down. Furthermore, should additional peer-reviewed scientific research efforts identify specific monitoring criteria not typically included for compliance monitoring, but essential for long-term performance monitoring, the guidance and regulations will be revised accordingly.

Therefore, a proactive monitoring program is not just additional ground water and gas migration wells and/or increased monitoring frequency of these wells. It entails monitoring of additional aspects of the landfill, including, but not limited to, leachate and landfill gas quality and quantity; settlement, including differential settlement; vegetation propagation; slope stability; ground water movement; and erosion control. In addition to monitoring these aspects, a PMP would also analyze for trends in these aspects. A continuing trend of lower volumes of leachate and landfill gas and less settlement would indicate that the landfill is stabilizing. The PMP data and analysis is needed to determine the overall condition of the landfill and the level of potential threat posed by the waste in the landfill to public health and safety and the environment.

Enforcement

A proactive monitoring program will not directly result in issuance of a violation or enforcement order. Furthermore, although approval of a step-down is contingent on the implementation of an approved PMP, approval of a step-down is not contingent on the results of the analysis conducted for the PMP. However, routine compliance monitoring programs that may be incorporated as part of a PMP are subject to potential issuance of violations and enforcement orders that could be a basis for denial of a step-down if the criteria under 27 CCR 22211(a)(2)(C)1. are not met. Enforcement of routine compliance monitoring programs is conducted independent of the PMP and solely by the respective agency with jurisdiction.

Proactive Monitoring Components

The primary components for proactive monitoring during the postclosure maintenance period include: leachate quality and quantity; the quality, quantity, and migration of landfill gas; ground and surface water quality and movement; final cover settlement including differential settlement, slope stability, integrity, and maintenance history including repair and replacement; and erosion control and vegetation propagation.

Although each proactive monitoring program will need to be based on site-specific conditions, examples of the data potentially necessary for proactive monitoring include, but are not limited to:

- *Leachate*—Leachate quality indicators such as biochemical oxygen demand (BOD) and chemical oxygen demand (COD) and other general condition indicators; current and historic leachate generation rate; sampling and analytical methods and the frequency and locations of sampling; a list of those Federal Appendix II constituents that used to be detected but are no longer so; a list of those Federal Appendix II constituents that still exceed their respective practical quantitation levels (PQL) in leachate, and, for each constituent, its change in concentration over time; and the concentration change, over time, of nonhazardous constituents that are among the landfill's named Constituents of Concern.
- *Landfill Gas (LFG)*—Current and historic LFG generation rate; methodology to determine the LFG generation rate (i.e., model used), site-specific modeling input parameters; model output; LFG composition (bulk gas constituents, trace non-methane organic constituents (NMOCs), and, for each, a concentration-verses-time plot); sampling and analytical methods and frequency and locations of sampling; internal gas pressure in the landfill (from wellheads, permanent/temporary probes).
- *Ground and Surface Water*—Current/historic ground water and surface water monitoring data and flow direction [using piezometers, compliance wells (including any along the Point of Compliance {POC}) and background wells]; previous/existing impacts attributable to leachate, LFG, or a combination thereof, including the waste constituents involved; and a history and current status of corrective action measures.

- *Final Cover*—Settlement calculations (current and historic) and maps; propagation and persistence of vegetation; current and historic erosion; stability reactions to seismic events; cover component integrity (including both visual inspection and permeability testing and/or leak detection).

In developing a PMP, the operator should demonstrate the appropriateness and reasonableness of the proposed proactive monitoring items as they relate to the specific conditions of the landfill. Agency review of a PMP is addressed in a later section.

Guidance documents have been prepared which address proactive (or performance-based) monitoring with an eye toward indentifying and tracking change, over time, in the threat posed by the waste in the landfill to public health and safety and the environment. These documents include:

- Interstate Technology Regulatory Council (ITRC), Alternative Landfill Technologies Team, postclosure care approach titled, **“Evaluating, Optimizing, or Ending Post-Closure Care at Municipal Solid Waste Landfills Based on Site-Specific Data Evaluations,”** dated September 2006.
- Environmental Research & Education Foundation (EREF) postclosure care approach titled, **“Performance-Based System for Post-Closure Care at MSW Landfills: A Procedure for Providing Long-Term Stewardship under RCRA Subtitle D,”** prepared by GeoSyntec Consultants, dated September 2006.

While the ultimate goal of these documents is to facilitate optimizing postclosure maintenance, the underlying principle of the documents is to develop a PMP to provide a holistic evaluation of the overall condition of the landfill. These documents provide detailed options for monitoring based on various landfill factors. These documents may be used to develop a site-specific proactive monitoring program. The EREF report may be obtained from EREF at:

http://erefdn.org/index.php/resources/publicationdonation/performance_based_system_for_post_closure_care_at_msw_landfills_a_procedure/.

The ITRC report may be found at: <http://www.itrcweb.org/Documents/ALT-4.pdf>.

Proactive Monitoring Plan Approval and Periodic Review

If an operator intends to implement a PMP, it needs to be specifically described in the postclosure maintenance (PCM) plan for the landfill. The PCM plan shall designate which monitoring items would be considered the proactive monitoring portion. The PCM plan will be reviewed by the regulatory agencies (CalRecycle, RWQCB, and EA) to determine whether it meets all applicable regulatory performance standards and whether a PMP will provide the necessary data to evaluate the overall condition of the landfill. Approval of the PMP is included within the approval of the PCM plan. As with PCM plans, each agency would review and approve those portions of a PMP within its jurisdiction. (See PRC 43506[b].)

Since a PMP is part of the PCM plan, the costs associated with a PMP are to be included within the costs for PCM and the related financial assurances. The operator may, but need not, list the

PMP costs as separate line items. However, since a PMP is a voluntary program, any excess costs for PMP items that are not part of compliance monitoring would not adversely impact the PCM cost consistency regulatory criterion.

As part of the PCM plan, a PMP shall be re-evaluated at least every five years to determine if the program is providing the appropriate data to demonstrate the overall condition of the landfill. If necessary, revisions to a PMP may be requested by any of the regulatory agencies if they believe that the program is not providing the appropriate data. To the extent required by law, regulation, or agency policy and procedures, if any regulatory agency requests changes to a PMP, the agency will provide the reason(s) to support the requested changes. The operator is not required to make the requested changes with the understanding that failure to include the requested changes may jeopardize the ability of the operator to successfully secure approval of a request to step down financial assurance obligations and may require the operator to step-up financial assurances.

Step-Down Approval

For a five multiplier (5X annualized postclosure maintenance cost) step-down to be approved, the operator must demonstrate that the operator has consistently performed an approved proactive monitoring program that produces a holistic evaluation of the condition, characteristics, and trends of the landfill.

By conducting this monitoring, the operator's knowledge about the landfill conditions improves, allowing it to identify any deficiencies needing to be addressed. As a result, the operator's scope of postclosure maintenance activities will more accurately reflect the site's needs, and the attendant cost of each activity may be more accurately estimated. An operator so forewarned would be able to take proactive action to remedy noted deficiencies, thereby lowering future costs. This would also result in reduced risk to the State upon a default by an owner/operator.

Although approval of the step-down is not contingent upon the results of the proactive monitoring (i.e., Is the landfill stabilizing?), if required compliance monitoring does indicate that the landfill is violating State regulatory standards leading to the issuance of an enforcement order, the issuance of such an order would result in the denial of a step-down (under the step-down criterion that the landfill be free of an enforcement order during the prior five years), unless an exception applies.

Step-Up Potential

To provide an incentive for the operator to continue performing high quality postclosure maintenance, the regulations also set forth the criteria for increasing the multiplier if the multiplier had been decreased previously. When proactive monitoring is no longer being performed, the operator would be required to increase the multiplier in increments of five (5), with such increases being limited to one (1) within a five (5) year period, to a maximum of 30 (30X). Therefore, to maintain the lower multiplier, the operator would need to continue proactive monitoring until released from postclosure maintenance. In fact, it is this very sort of monitoring that will enable the operator to make, and validate, a claim that less postclosure

maintenance is necessary and possibly that the waste no longer poses a threat to public health and safety and the environment. However, although it is advisable always to implement a PMP, the operator may be able to justify modifications to it based on the specific conditions of, and within, the landfill.

Similar to the step-down, should compliance monitoring indicate that the landfill is not meeting state regulatory standards leading to the issuance of an enforcement order, the issuance of the enforcement action would result in a step-up (under the step-up criterion involving such orders), unless an exception applies.

Dispute Resolution Process

CalRecycle, EA, and RWQCB will review the PMP as part of the normal Closure and Postclosure Maintenance Plans (CPCMP) review and approval process. The schedule and process for review and approval or denial of CPCMP is set forth in 27 CCR 21860. The current delegated authority for approval or denial of CPCMP for CalRecycle is the Chief of the Cleanup Closure and Financial Assurance Division. In the event that a dispute regarding the PMP or step-down is not resolved through the normal review and approval process, CalRecycle will institute a dispute resolution process similar to that established for Landfill Gas Monitoring Plans. (See

<http://www.calrecycle.ca.gov/SWFacilities/Landfills/Gas/Monitoring/Plans/DisputeRes.htm>.)

This guidance will be updated, as necessary, at a later date to incorporate the specific procedures and process to be used for dispute resolution.
